UTILITY PATENT APPLICATION TRANSMITTAL LETTER

(Only for new nonprovisional applications under 37 CFR 1.53(b))

Docket No.
PNDF-00108

To the Assistant Commissioner for Patents:

Transmitted herewith for filing is the patent application of:
Kenji SOGA
corresponding to Japanese application 11-292131, filed October 14, 1999,
entitled: METHOD FOR DESIGNING TREE-STRUCTURED COMMUNICATION ROUTES AND TREE-STRUCTURE SOLUTION OF COMMUNICATION ROUTES

Enclosed are:

X	11 pages of specification.
X	4 sheets of formal drawings.
X	a newly-executed declaration of the inventor.
	a copy of an executed declaration of the inventor from prior application Serial No. , filed .
	incorporation by reference. The entire disclosure of the prior application, from which a copy of the oath or declaration is supplied as indicated in the preceding box, is considered as being part of the disclosure of the accompanying application and is hereby incorporated by reference therein.
X	an assignment of the invention to NEC CORPORATION, including assignment cover sheet.
	Information Disclosure Statement with Form PTO-1449.
	copies of the Information Disclosure Statement citations.
	preliminary amendment.
X	return receipt postcard (MPEP 503), specifically itemized.
	applicant claims small entity status under 37 CFR 1.27.
X	a certified copy of the Japanese Priority Document.
X	other: Data Entry Sheet .

If a CONTINUING APPLICATION, *check appropriate box and supply the requisite information.*

☐ Continuation ☐ Divisional ☐ Continuation-in-part (CIP)

of prior application No. , filed .

X	Customer No. 000466.
X	Correspondence address is: YOUNG & THOMPSON, 745 South 23rd Street, Second Floor, Arlington, Virginia 22202.
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UTILITY PATENT APPLICATION TRANSMITTAL LETTER (continued)	Docket No. PNDF-00108

CLAIMS AS FILED

	NO. FILED	NO. EXTRA	RATE	FEE
BASIC FEE			$ 710	$ 710
TOTAL CLAIMS	5 - 20 =	0	x$ 18	0
INDEPENDENT CLAIMS	3 - 3 =	0	x$ 80	0
MULTIPLE DEPENDENT CLAIM PRESENT			$ 270	
			TOTAL	$ 710

If applicant has small entity status under 37 CFR 1.9 and 1.27, then divide total fee by 2, and enter amount here.	**SMALL ENTITY TOTAL**	$

X	A check in the amount of $750 to cover the filing fee is enclosed.
X	The Commissioner is hereby authorized to charge indicated fees and credit any overpayments to Deposit Account No. 25-0120 in the name of Young & Thompson, as described below. A duplicate copy of this sheet is enclosed.
	Charge the amount of $ as filing fee.
X	Credit any overpayment.
X	Charge any additional fee required under 37 CFR 1.16 and 1.17, during the pendency of this application.
	Charge the issue fee set in 37 CFR 1.18 at the mailing of the Notice of Allowance.

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October 13, 2000

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Country of Residence::	JAPAN
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APPLICATION INFORMATION

Title Line One::	METHOD FOR DESIGNING TREE-STRUCTURED
Title Line Two::	ROUTES AND TREE-STRUCTURE SOLUTION OF
Title Line Three::	COMMUNICATION ROUTES
Total Drawing Sheets::	4
Formal Drawings?::	YES
Application Type::	UTILITY
Docket Number::	PNDF-00108

REPRESENTATIVE INFORMATION

Representative Customer Number:: 000466

PRIOR FOREIGN APPLICATION

Foreign Application One::	11-292131
Filing Date::	OCTOBER 14, 1999
Country::	JAPAN
Priority Claimed::	YES

METHOD FOR DESIGNING TREE-STRUCTURED COMMUNICATION ROUTES AND TREE-STRUCTURE SOLUTION OF COMMUNICATION ROUTES

FIELD OF THE INVENTION

The invention relates to a method for designing tree-structured communication routes and a tree-structure solution of communication routes, and especially to a method for heuristically designing tree-structured communication routes which quickly derives a solution for maintaining the number of input nodes large and keeping down the number of trees generated therein, and a tree-structure solution of communication routes derived by means of the aforementioned method.

BACKGROUND OF THE INVENTION

Trees are made up by given communication routes. The communication routes comprise many nodes. The tree is formed as a set of branches connected with the many nodes. A problem that the plural routes connected with the plural ingress nodes is given to a certain egress node and the number of the trees is minimized is solved by means of the mixed-integer program. The mixed-integer program gives the optimum solution certainly.

When the scale of the problem becomes large and the numbers of the given routes and the given trees become large, it is inevitable that a time necessary for deriving the optimum solution becomes extremely long. Accordingly, it is desirable to quickly derive an approximate solution which keeps down the number of the trees, even if the optimum solution is not necessarily obtained and the number

of the trees is not minimized.

SUMMARY OF THE INVENTION

Accordingly, it is an object of the invention to provide a method for designing tree-structured communication routes for quickly deriving a solution which keeps down the number of the trees, even if the optimum solutions is not necessarily obtained and the number of the trees is not minimized, and to provide a tree-structure solution of the communication routes.

It is a further object of the invention to provide a method for designing tree-structured communication routes for quickly deriving a solution which keeps down the number of the trees, even if the optimum solution is not necessarily obtained and the number of the trees is not minimized, and renews the tree simply when a new route is added thereto, and to provide a tree-structure solution of the communication routes.

Means for realizing the objects of the invention is expressed as follows. Technical items in the following descriptions are enclosed by parentheses, and numerals and signs, etc. are added thereto. The numerals, signs, etc. agree with those added to the technical items constituting plural embodiments of the invention or at least one of them, and especially with those added to the technical items shown in drawings corresponding to the embodiments of the invention. Although these reference numerals and reference signs clarifies mediations between the technical items in claims and those shown in the embodiments, the mediations never mean that the technical items written in the claims are interpreted so as to be restricted to those of the embodiments.

According to the first feature of the invention, a method for designing tree-structured communication routes, in which plural ingress nodes(E1 to Ei), a single egress node(Es:s=1 to i), plural connection nodes (C1 to Cj) situated between the plural ingress nodes (E1 to Ei) and the single egress node (Es), and plural routes starting from the plural ingress nodes(E1 to Ei) to the single egress node (Es) via the plural connection nodes (C1 to Cj)are given, comprises the steps of:

adding a predetermined point to a score of a route successively selected from the plural routes,

successively selecting the routes in reverse order of the scores of the routes,

respectively generating trees from the route with the lowest score and the other routes, and

successively generating other trees from the routes which are unable to generate the trees,

wherein the step of adding the predetermined point to the score of the selected route is carried out whenever either of

(1) the first condition that any node in a selected route does not appear on the other route except the egress node, or

(2) the second condition that, when there is a node which appears in both the selected and other routes, the selected route agrees with the other route from the node to the egress node,

is satisfied.

The trees for accommodating all the route can be generated certainly in accordance with the aforementioned way of scoring, and even if the generated trees are not optimized and the number of the

trees is not minimized, generation of the tree can be heuristically conducted at a high speed. Advantage of this method is that, even when a new route is added to the tree-structure once constructed, the tree can be again generated. Even when the route is replaced with a tree, the method according to the invention can be still applied thereto. From this point of view, the route may be regarded as the tree, hence the route may be regarded as the route or the tree. It is advisable that a point added to the score of the route is +1 point simply and uniformly.

A tree-structure solution according to the invention is a tree-structure solution derived by means of the aforementioned method for designing the tree-structured communication routes. The tree-structure solution of the communication routes can be recorded in a recording medium so as to be read by a computer.

BRIEF DESCRIPTION OF THE DRAWINGS

The invention will be explained in more detail in conjunction with the appended drawings, wherein:

FIG.1 is a flow chart for showing an embodiment of a method for designing a tree-structured communication routes according to the invention,

FIG.2 is a diagram for showing a tree-structured communication routes,

FIG.3 is a flow chart for showing a method for calculating a score of a route in a tree-structured communication routes according to the invention,

FIG.4 is a flow chart for showing a method for judging whether generation of a tree is possible or not in a method for designing

a tree-structured communication routes, and

FIG.5 is a flow chart for showing a method for generating trees in a method for designing tree-structured communication routes according to the invention.

DESCRIPTION OF THE PREFERRED EMBODIMENTS

As shown in FIG.1, an embodiment of the method for designing tree-structured communication routes is composed of a route-scoring means 1 for adding a predetermined point to a score of each route and keeping the score as mentioned later, a route rearranging means 2 for rearranging the routes in accordance with the scores thereof, and a tree-generating means 3 for successively generating trees from the rearranged routes.

The route-scoring means 1 is connected with the route-rearranging means 2, and the route-rearranging means 2 is connected with the tree-generating means 3. The tree-generating means operates in accordance with a program describing a solution which keeps down the number of the trees of the given routes and outputs a tree-structure solution at a high speed, and is provided with a recording medium for storing the aforementioned program. The program stored in the recording medium can be read by a computer selected at will.

FIG.2 exemplifies communication routes to which the method for designing the communication routes according to the invention is applied to derive a tree-structure solution. Ingress or egress nodes are denoted by E1,E2,……,E10 and connection nodes are denoted by C1,C2,…..,C5. The six routes metnioned as follows are extracted as a subset of the routes. The six routes is provided with the same

egress node E1.

Route 1 : E3-C2-E1

Route 2 : E3-C3-C4-C1-E1

Route 3 : E5-C3-C2-E1

Route 4 : E5-C4-C1-E1

Route 5 : E7-C4-C3-C2-E1

Route 6 : E7-C5-C1-E1

FIG.3 shows a method for scoring the route, which is a portion of the tree-structure solution. In Step 1, a route n is selected as an arbitrary one of the six routes. A score of the route n is initialed at Step S2, and set to be 0. Next, a route m other than the route n is selected (Step S3). Then, whether a tree can be generated or not from the routes n, m is judged. Both the end points of the route are denoted by E, and a point inserted between both the end points is denoted by C. Hereinafter, the node and the end point are used without distinction.

Whether the tree can be generated or not is judged on the bias of the rules mentioned as follows.

(1) If there is not a node which commonly appears in a route/tree A and a route/tree B, the tree can be generated from the route/tree A and the route/tree B.

(2) In case that there is a node which commonly appears in the route/tree A and the route/tree B, if the other node connected with the aforementioned common node appears in the route/tree A and the route/tree B commonly, the tree can be generated; and if not so, the tree cannot be generated.

The aforementioned criterions can be rewritten as follows.

(1) If any node in a route/tree A does not appear in a route/tree B except the egress node, a tree can be generated from the route/tree A and the route/tree B.

(2) In case that there is a node which appears in both the route/tree A and the route/tree B, if the route/tree A agrees with the route/tree B from the node to the egress node, the tree can be generated from the route/tree A and the route/tree B; and if not so, the tree cannot be generated from the route/tree A and the route/tree B.

FIG.4 shows a method for judging whether the tree can be generated or not in the aforementioned case. Whether there is a node commonly appearing in the route/tree n and the route/tree m or not is judged at Step S11. If there is not a common node, it is judged that a tree can be generated from the route /tree n and the route/tree m(Step S12). If there is a node commonly appearing in the route/tree n and the route/tree m, whether the other node connected with the aforementioned common node commonly appears in the route/tree n and the route/tree m or not is judged. If there is such a common node which is connected with the aforementioned common node, the process is shifted to Step S12, and it is judged that the tree can be generated. If there is not such a common node which is connected with the aforementioned common node, it is judged that generation of the tree is impossible (Step S14).

Whether the tree can be generated from the route n and the route m or not is judged at Step S4 in accordance with the criterion mentioned in the above. When generation of the tree is possible, one point is added to the score of the route n (Step S5). The score of the route n is given as 0+1=1 (point). When generation of the

tree is possible, 1 point is added to the score of the route n, and when generation of the tree is impossible, no point is added to the sore of the route n and the process advances to Step 6.

Since all the routes other than the route n has not been selected yet in Step S6, the process returns to Step S3. In Step S3, a route s (s=3, for instance) is selected, wherein the route s is different from the route m (m=2, for instance) formerly selected and from the route n (n=1, for instance). Steps S4 to S5 are repeated with respect to the route s, and one point is added to the score of the route s, when the tree can be generated. When whether the tree can be generated or not from the route n and all the routes other than n are respectively judged, the aforementioned calculations are conducted and the total score of the route n related to all the routes other than n are determined (Step S7), the process returns to Step S1, and a route k other than the route n is selected. Then, the aforementioned steps are repeated with respect to the route k, and the calculation of the total score of the route k related to all the routes other than the route k is conducted.

Explaining concretely, the node C3 appears in the routes 2,3 commonly, the node C3 is connected with the node C4 in the route 2, and the node C3 is connected with the node C2 in the route 3. Accordingly, since there is no common node connected with the aforementioned common node C3 in the routes 2,3, the tree cannot be generated from the routes 2,3. Since the node C2 appears in the routes 1,3 commonly and both the routes 1,3 are connected with a common node (the end point E1), the tree can be generated from the routes 1,3.

As mentioned in the above, the scores of the routes are calculated in this way, and a score table can be made up as follows.

Route 1 : E3-C2-E1: Score=4 points.

Route 2 : E3-C3-C4-C1-E1: Score=2 points.

Route 3 : E5-C3-C2-E1: Score=3 points.

Route 4 : E5-C4-C1-E1: Score=3 points.

Route 5 : E7-C4-C3-C2-E1: Score=2 points.

Route 6 : E7-C5-C1-E1: Score=4 points.

The route-rearranging means rearranges these routes in reverse order of the scores.

Route 2 : E3-C3-C4-C1-E1: Score=2 points.

Route 5 : E7-C4-C3-C2-E1: Score=2 points.

Route 3 : E5-C3-C2-E1: Score=3 points.

Route 4 : E5-C4-C1-E1: Score=3 points.

Route 1 : E3-C2-E1: Score=4 points.

Route 6 : E7-C5-C1-E1: Score=4 points.

The tree-generating means 3 generates the trees in the order of the arrangement of the routes rearranged by the route-rearranging means 2. FIG.5 shows the method for generating the trees. First, all the routes 1 to 6 are regarded as "design not yet completed" (Step S21). In the routes which are regarded as "design not yet completed", the route with the lowest score n (n=2, for instance) is selected (Step S22). The route n is regarded as a tree n formed only of the route n. The route/tree n is regarded as "design completed"(Step 23).

Next, the route m which is regarded as "design not yet completed" and has the second lowest score (m=5, for instance) is selected. Whether the tree can be generated from the tree n and the route m or not is judged in accordance with the aforementioned criterion (Step S25). If the tree can be generated from the tree

n and the route m, the route m is added to the tree n to generate a new tree, which is newly regarded as the tree n.

In this case, the tree m is regarded as "design completed " (Step 26). On the basis of the judgment of Step S27, Steps S24 to S26 are repeatedly applied to all the routes which are other than the route n and regarded as "design not yet completed." Steps S24 to S26 are repeatedly applied to all the routes, and whether all the routes are regarded as "design completed " or not is judged (Step S28). If one or more routes which are regarded as "design not yet completed" still remain, Steps 22 to 27 are repeatedly applied.

The following results are obtained in the first trial steps.

Route 2 : E3-C3-C4-C1-E1:Score=2 points: "design completed"

Route 5 : E7-C4-C3-C2-E1: Score= 2 points: "design not yet completed"

Route 3 : E5-C3-C2-E1: Score=3 points: "design not yet completed"

Route 4 : E5-C4-C1-E1: Score=3 points: "design completed"

Route 1 : E3-C2-E1: Score=4 points: "design not yet completed"

Route 6 : E7-C5-C1-E1: Score=4 points: "design completed"

As the result of the first trial steps, the tree 2 is composed of the routes 2,4,6.

Following results are obtained as the result of the second trial steps.

Route 2 : E3-C3-C4-C1-E1: Score=2 points: "design completed"

Route 5 : E7-C4-C3-C2-E1: Score=2 points: "design completed"

Route 3 : E5-C3-C2-E1: Score=3 points: "design completed"

Route 4 : E5-C4-C1-E1: Score=3 points: "design completed "

Route 1 : E3-C2-E1: Score=4 points: "design completed"

Route 6 : E7-C5-C1-E1: Score=4 points: "design completed "

As the result of the second trial steps, the tree 2 is composed of the routes 2,4,6, and the tree 5 is composed of the routes 5,3,1.

The method for generating the new trees mentioned in the above can be applied to a case where the routes and the trees are mixedly given as the input parameters as well as to a case where only the routes are given as input parameters by regarding the routes shown in FIGs. 3 and 5 as the trees. After the tree is once generated, a new tree can be further generated by adding a new route thereto.

According to the method for designing the tree-structured communication routes and the tree-structure solution of the communication routes according to the invention, the tree can be generated at a high speed. Moreover, a new tree can be generated by further adding a route to the tree once generated.

Although the invention has been described with respect to specific embodiment for complete and clear disclosure, the appended claims are not to be thus limited but are to be construed as embodying all modification and alternative constructions that may be occurred to one skilled in the art which fairly fall within the basic teaching here is set forth.

What is claimed is:

1. A method for designing tree-structured communication routes, in which plural ingress nodes, a single egress node, plural connection nodes situated between said plural ingress nodes and said single egress node, and plural routes starting from said plural ingress nodes to said single egress node via said plural connection nodes are given, comprising the steps of:

adding a predetermined point to a score of a route successively selected from said plural routes,

successively selecting said routes in reverse order of said scores of said routes,

respectively generating trees from said route with a lowest score and said other routes, and

successively generating other trees from said routes which are unable to generate said trees,

wherein said step of adding said predetermined point to said score of said selected route is carried out whenever either of

(3) a first condition that any node in a selected route does not appear on another route except said egress node, or

(4) a second condition that, when there is a node which appears in both said selected and another routes, said selected route agrees with said another route from said node to said egress node,

is satisfied.

2. The method for designing tree-structured communication route as defined in claim 1, wherein:

said predetermined point to be added to said score of said selected route is +1 point.

3. The method for designing tree-structured communication route as defined in claim 1, wherein:

said route is regarded as a route or a tree.

4. A tree-structure solution derived by mean of a method for designing tree-structured communication routes, in which plural ingress nodes, a single egress node, plural connection nodes situated between said plural ingress nodes and said single egress node, and plural routes starting from said plural ingress nodes to said single egress node via said plural connection nodes are given, comprising the steps of:

adding a predetermined point to a score of a route successively selected from said plural routes,

successively selecting said routes in reverse order of said scores of said routes,

respectively generating trees from said route with a lowest score and said other routes, and

successively generating other trees from said routes which are unable to generate said trees,

wherein said step of adding said predetermined point to said score of said selected route is carried out whenever either of

(1) a first condition that any node in a selected route does not appear on another route except said egress node, or

(2) a second condition that, when there is a node which appears in both said selected and another routes, said selected

route agrees with said another route from said node to said egress node,

is satisfied.

5. A recording medium recording a tree-structure solution derived by means of a method for designing tree-structured communication routes, in which plural ingress nodes, a single egress node, plural connection nodes situated between said plural ingress nodes and said single egress node, and plural routes starting from said plural ingress nodes to said single egress node via said plural connection nodes are given, comprising the steps of:

adding a predetermined point to a score of a route successively selected from said plural routes,

successively selecting said routes in reverse order of said scores of said routes,

respectively generating trees from said route with a lowest score and said other routes, and

successively generating other trees from said routes which are unable to generate said trees,

wherein said step of adding said predetermined point to said score of said selected route is carried out whenever either of

(1) a first condition that any node in a selected route does not appear on another route except said egress node, or

(2) a second condition that, when there is a node which appears in both said selected and another routes, said selected route agrees with said another route from said node to said egress node,

is satisfied,

wherein said tree-structure solution can be read by a computer.

ABSTRACT OF THE DISCLOSURE

A method for designing tree-structured communication routes, in which plural ingress nodes, a single egress node, plural connection nodes situated between the plural ingress nodes and the single egress node, and plural routes starting from the plural ingress nodes to the single egress node via the plural connection nodes are given, comprises the steps of:

adding a predetermined point to a score of a route successively selected from the plural routes,

successively selecting the routes in reverse order of the scores of the routes,

respectively generating trees from the route with the lowest score and the other routes, and

successively generating other trees from the routes which are unable to generate the trees,

wherein the step of adding the predetermined point to the score of the selected route is carried out whenever either of

(1) a first condition that any node in a selected route does not appear on the other route except the egress node, or

(2) a second condition that, when there is a node which appears in both the selected and other routes, the selected route agrees with the other route from the node to the egress node,

is satisfied.

FIG. 1

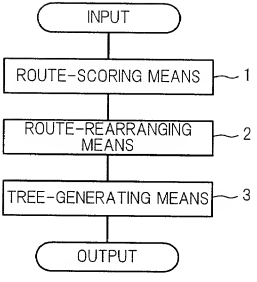

INPUT
ROUTE-SCORING MEANS
1
ROUTE-REARRANGING MEANS
2
TREE-GENERATING MEANS
3
OUTPUT

FIG. 2

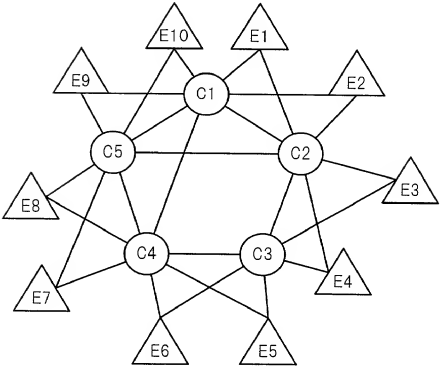

E10
E1
E9
E2
C1
C5
C2
E3
E8
C4
C3
E4
E7
E6
E5

FIG.3

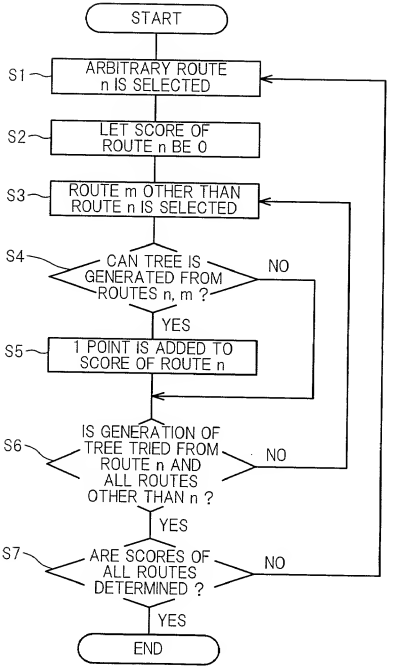


FIG.4

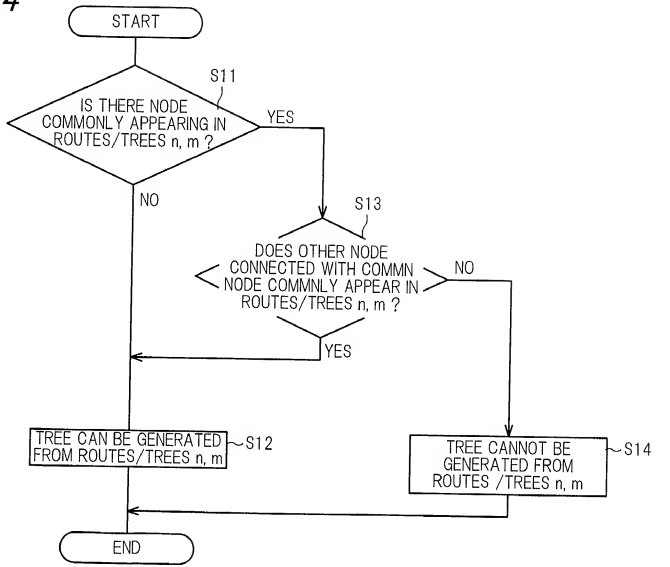
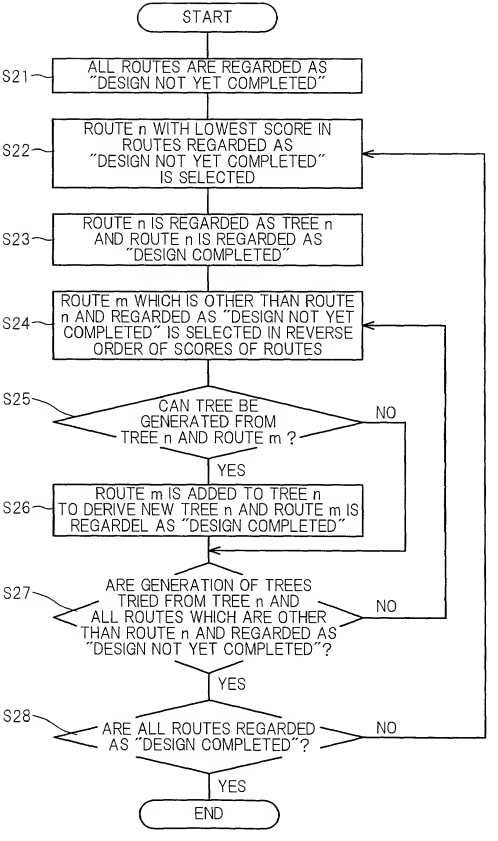

START
S11
IS THERE NODE COMMONLY APPEARING IN ROUTES/TREES n, m ?
YES
NO
S13
DOES OTHER NODE CONNECTED WITH COMMN NODE COMMNLY APPEAR IN ROUTES/TREES n, m ?
NO
YES
TREE CAN BE GENERATED FROM ROUTES/TREES n, m
S12
TREE CANNOT BE GENERATED FROM ROUTES /TREES n, m
S14
END

FIG. 5



COMBINED DECLARATION AND POWER OF ATTORNEY

As a below named inventor, I hereby declare that

My residence, post office address and citizenship are as stated below next to my name.

I believe I am the original, first and sole inventor (if only one name is listed below) or an original, first and joint inventor (if plural names are listed below) of the subject matter which is claimed and for which a patent is sought on the invention entitled:

"METHOD FOR DESIGNING TREE-STRUCTURED COMMUNICATION ROUTES AND TREE-STRUCTURE SOLUTION OF COMMUNICATION ROUTES

the specification of which: *(check one)*

REGULAR OR DESIGN APPLICATION

[x] is attached hereto.

[ ] was filed on as application Serial No.
and was amended on (if applicable).

PCT FILED APPLICATION ENTERING NATIONAL STAGE

[ ] was described and claimed in International application No. filed on
and as amended on (if any).

I hereby state that I have reviewed and understand the contents of the above-identified specification, including the claims, as amended by any amendment referred to above.

I acknowledge the duty to disclose information which is material to patentability as defined in Title 37, Code of Federal Regulations, '1.56.

PRIORITY CLAIM

I hereby claim foreign priority benefits under 35 USC 119 of any foreign application(s) for patent or inventor's certificate listed below and have also identified below any foreign application for patent or inventor's certificate having a filing date before that of the application on which priority is claimed.

PRIOR FOREIGN APPLICATION(S)

Country	Application Number	Date of Filing (day, month, year)	Priority Claimed
JAPAN	**11-292131**	**14.10.1999**	**YES**

(Complete this part only if this is a continuing application.)

I hereby claim the benefit under 35 USC 120 of any United States application(s) listed below and, insofar as the subject matter of each of the claims of this application is not disclosed in the prior United States application in the manner provided by the first paragraph of 35 USC 112, I acknowledge the duty to disclose information which is material to patentability as defined in Title 37 Code of Federal Regulations '1.56 which became available between the filing date of the prior application and the national or PCT international filing date of this application:

(Application Serial No.) (Filing Date) (Status--patented, pending, abandoned)

POWER OF ATTORNEY

The undersigned hereby authorizes the U.S. attorney or agent named herein to accept and follow instructions from Hirata & Partners as to any action to be taken in the Patent and Trademark Office regarding this application without direct communication between the U.S. attorney or agent and the undersigned. In the event of a change in the persons from whom instructions may be taken, the U.S. attorney or agent named herein will be so notified by the undersigned.

As a named inventor, I hereby appoint the following attorney(s) to prosecute this application and transact all business in the Patent and Trademark Office connected therewith: **Robert J. PATCH, Reg. No. 17,355, Andrew J. PATCH, Reg. No. 32,925, Robert F. HARGEST, Reg. No. 25,590, BenoTt CASTEL, Reg. No. 35,041, Eric JENSEN, Reg. No. 37,855, Thomas W. PERKINS, Reg. No. 33,027, and Roland E. LONG, Jr., Reg. No. 41,949**, c/o YOUNG & THOMPSON, Second Floor, 745 South 23rd Street, Arlington, Virginia 22202.

Address all telephone calls to Young & Thompson at 703/521-2297.

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

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Inventor's signature _____ Date _____

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Witness:

Date: September 28, 2000 Tadayuki Ichikawa

Date: September 28, 2000